Digital Health and Technology Brief

When most people think about cutting edge techonological developments and new applications in digital health, they think of Silicon Valley. But that is not always the case. Ochsner Health System (Ochsner), headquartered in New Orleans, LA, and ranked a top 100 hospital by Truven Health Analytics 2017, is leading the nation in digital health and has partnered with leading innovators, such as Apple, to pilot and deploy innovations.

Today more than ever before, advances in technology are dramatically changing the way care is delivered. Spearheaded by the innovationOchsner (iO) and CareConnect 360 telehealth teams and fueled by systemwide collaborative efforts, Ochsner is rapidly accelerating the use of technology and data to develop innovative precision-focused and patient-centered solutions. We are proud to have designed and implemented a number of national award-winning programs in digital medicine. Our initiatives have:

- resulted in significant improvements in the care and management of patients with chronic disease;
- accelerated diagnoses and treatment for patients with acute and deteriorating medical conditions; and,
- provided vital and real-time health information and continuous engagement with individual patients in hospital, home, and community based settings.

We are eager to bring our experiences to bear to the benefit of federal and state governments, the private sector, and the nation.

***innovationOchsner*- Ochsner's Innovation Lab**

In 2015, Ochsner formed its own innovation lab known as innovationOchsner (iO), whose mission is to reimagine and revolutionize the delivery and experience of healthcare and dramatically improve health outcomes using technology, data and new thinking. Through iO, Ochsner has been a pioneer in developing solutions in the areas of digital health, advanced analytics and artificial intelligence (AI), and precision medicine.

Our investment and focus in this area has resulted in a number of ground-breaking innovations, which are measurably advancing the quadruple aim of health care: improve the patient experience of care, improve the health of populations, reduce the per capita cost of health care, and improve the work life of the provider of care.

Providing Patients with Physician-Approved and Prescribed Apps & Devices: The O Bar

Ochsner has launched a novel service to introduce patients and consumers to personalized health technology – the O Bar, a "Genius Bar" for health care technology offerings. A national model for promoting patient engagement in technology to improve outcomes, the O Bar makes it easy for patients and the communities we serve to learn about, test and obtain health care-related apps and connected devices, with the help of an Ochsner-staffed expert. Now with six locations in Jefferson Parish, New Orleans, Baton Rouge, Covington and Westwego and more in development, the O Bar offers a curated selection of apps focused on wellness, nutrition, fitness, diabetes, women's health, smoking cessation and more, as well as state-of-the art medical devices including Bluetooth blood glucose monitors, wireless blood pressure monitors, activity trackers, and wireless scales. Ochsner physicians tailor and prescribe apps and devices for their patients, and O Bar staff can help patients by downloading and demonstrating the use of apps and devices. This ensures that patients of all ages and skills can easily access and use these digital health tools.[1]

Partnering with Apple Health and Epic Electronic Health Records (EHR) for Data Integration

Ochsner has developed advanced digital medicine programs that immediately feed patient-generated data into its EHR, and was the first health system in the nation to integrate its Epic EHR system with Apple Health, an IOS app that acts as a health dashboard by capturing health and activity data from other apps and wearable devices.[2] These data provide physicians and the care team a more complete and up-to-date view of a remote patient's health status and allows and empowers providers to offer proactive, holistic care and recommendations, from medication management to lifestyle factors, leading to better health outcomes, lower costs, and higher levels of patient engagement, satisfaction, and convenience.

Using the integrated data and health dashboard, Ochsner has developed and implemented programs targeted to support patients with congestive heart failure, diabetes, hypertension and cancer, as well as expectant mothers, to help them stay connected to their care teams between their in-person visits to their physicians. These programs will be expanded and adapted to treat asthma, arthritis, chronic obstructive pulmonary disease, high cholesterol and many other conditions. Chronic disease accounts for 75% of deaths and 86% of healthcare costs in the United States, so innovative models of care like Ochsner Digital Medicine that dramatically improve health outcomes are critical in our quest to save and change more lives.

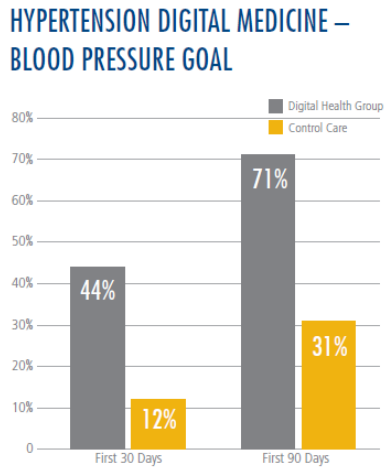
[1] The O Bar has been featured on CNBC; the report can be viewed at https://www.cnbc.com/2015/06/09/take-this-app-and-ill-call-you-in-the-morning.html.

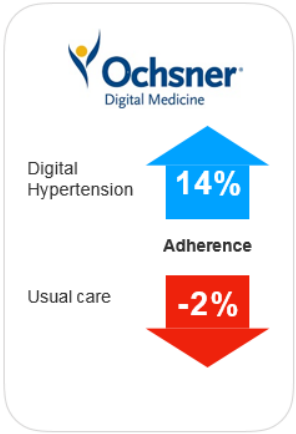
[2] A profile of Ochsner's Hypertension Digital Medicine program can be found on the Apple healthcare website under the heading "Continue Patient Care at Home" https://www.apple.com/healthcare/.

Delivering Cost-Effective Care for Chronic Disease: *Ochsner Digital Medicine*

The Ochsner Hypertension Digital Medicine program is an innovative way to care for high blood pressure, the most prevalent chronic disease in the United States (and indeed the world), where half of all patients still suffer from uncontrolled blood pressure. In contrast to traditional models of care, which are based on episodic data points and physician visits, our Hypertension Digital Medicine program offers a continuous care model, where patients send in regular data and are remotely monitored by a dedicated care team that provides proactive, preventive interventions. Patients enrolled in the program take their blood pressure weekly using a wireless, at-home blood pressure cuff. The results are transmitted to their care team, which is able to see the trends in each patient's blood pressure measurements and make changes to their treatment when needed. This is an innovative approach that allows more frequent data and a more meangingful feedback loop between patients and the care team, instead of relying on only a handful of readings each year during in-office visits. Using this real-time information and trend data, we can provide their patients timely and tailored feedback, such as medication adjustments, healthy eating tips, and exercise goals. Patients and doctors receive monthly reports to track progress.

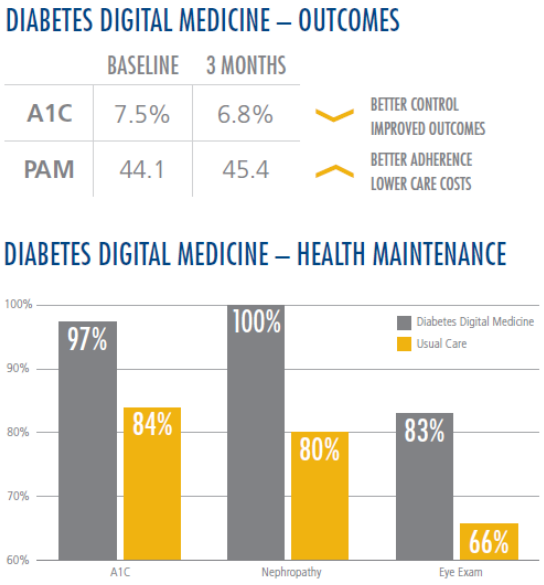
Results of the program show it is an effective means of achieving and maintaining blood pressure control. More than 71% of patients, who were previously out of control, achieved control within 90 days of entering the program, compared to 31% percent of patients following the traditional care model.[3] Through its intentional focus on patient engagement, Hypertension Digital Medicine has also been shown to increase medication adherence by 14%, compared with a 2% lower adherence in the usual care control group. For patients, lower blood pressure means a lower likelihood of heart attack, stroke, and kidney failure. In turn, these changes in patient risk factors for numerous chronic diseases will reduce costs and improve patient quality of life.





[3] Milani RV, et al., *Improving Hypertension Control and Patient Engagement Using Digital Tools*, Am J Medicine 2017;130:14-20.

Ochsner is extending the benefits of digital medicine to additional chronic diseases. The Ochsner Diabetes Digital Medicine program offers convenient, real-time monitoring and coordinated care shown to help patients improve contol of their diabetes. We use a smart glucometer to receive at-home blood sugar readings, allowing our dedicated care team to monitor data in real-time and provide proactive interventions. The program has resulted in improvements in hemoglobin A1c levels, with an absolute 0.7% drop after just 90 days in the program. Diabetes Digital Medicine also seeks to help patients manage their routine health maintenance activities, which can be a time-consuming and frustrating task under usual care. This effort has resulted in a significant improvement in closing care gaps, such as routine eye exams and screenings. The program has also been shown to result in increased patient engagement, with patients feeling more knowledgeable and confident about their ability to manage their own health.



Ochsner Digital Medicine has received national recognition. The HHS Office of the National Coordinator has recognized the program as a model for patient engagement in its Patient Engagement Playbook.[4] Likewise, Apple has featured Ochsner's Digital Medicine program as a model for leveraging technology and data to improve health outcomes and patient engagement.[5] Harvard Medical School and Harvard Business School have also recognized Ochsner's innovative

[4] Ochsner Digital Medicine is described in Chapter 5 of the playbook, which can be found here: https://www.healthit.gov/playbook/pe/.

[5] A video describing the program is featured on the Apple healthcare website under the heading "Continue Patient Care at Home" and can be found at https://www.apple.com/healthcare/.

program as a finalist in its Health Acceleration Challenge.[6] And most recently, Ochsner was awarded the 2018 HIMSS Davies Enterprise Award, citing "Ochsner's unique application of integrating digital medicine and remote home monitoring into patient care [that] has generated significant improvements in population health while improving patient satisfaction,"[7] while the *Washington Post* recently detailed Ochsner's leadership in creating the program.[8]

Innovating Hospital Care Delivery and Patient Communication: *Optimal Hospital*

Ochsner is leading the way to improve hospital care by addressing "posthospital syndrome," a condition that can be acquired during hospitalization due to physiologic stress that patients experience while in the hospital.[9] To address this, iO launched its Optimal Hospital initiative which uses new technology, science and work flows to improve outcomes and the hospital experience for patients. The program includes several elements:

- Patients are given wireless vital sign monitors to allow for continuous data collection that is entered automatically into the electronic health record, while still allowing for patient mobility.

- Patients are offered mobile tablets through which the patient can access information about their attending physician and care team, educational resources, the schedule of the day, test results, and medication information, all which assists in helping patients feel supported and less overwhelmed while in the hospital.

- Several interventions are designed to prevent disruption of sleep and normal circadian rhythms, including substituting red lighting after hours in place of standard blue-enriched (white) light, delayed routine lab draw times and noise monitoring.

- Physicians also have mobile access to devices and apps through which they can see patient test results, which can assist them in communicating with and caring for their patients throughout the day and in different locations within the medical center. The program has

[6] https://news.ochsner.org/news-releases/ochsner-health-system-named-a-national-innovation-finalist-by-harvard-busin.

[7] https://www.healthcareitnews.com/news/relentless-focus-innovation-wins-ochsner-himss-davies-award.

[8] https://www.washingtonpost.com/business/economy/these-louisiana-physicians-can-monitor-your-blood-pressure--and-you-dont-even-have-to-leave-your-living-room/2018/07/11/6d57f198-7beb-11e8-93cc-6d3beccdd7a3_story.html?noredirect=on&utm_term=.f3715e8bd2dd.

[9] The risks associated with posthospital syndrome are described in a recent *New York Times* article published August 3, 2018 and can be found at https://www.nytimes.com/2018/08/03/health/post-hospital-syndrome-elderly.html.

been well-received by patients and has improved efficiency and flow of information to physicians. [10]

The program has resulted in improved health outcomes, including higher levels of emotional and mental health as measured by HCAHPS, 16% and 12% reductions in 30-day and 90-day readmissions, respectively, and an 8.6-hour reduction in the average length of stay.[11]

Using Advanced Analytics to Predict and Improve Hospital Patient Care: *2018 Microsoft Health Innovation Award For Artificial Intelligence And Machine Learning*

To further improve hospital care, Ochsner is harnessing the power of AI and machine learning to predict and prevent adverse events in the hospital, notably becoming one of the first health systems in the world to use this type of technology. In a recent use case, Ochsner deployed an AI model to predict patient deterioration, or "codes," in the hospital. The artifical intelligence uses more than one billion clinical data points, to continuously assess each hospitalized patient to determine who is at risk. These complex machine learning algorithms are powered by Epic machine learning and Microsoft Azure cloud platforms.[12]

Using this tool, Ochsner's rapid response team of clinical providers is notified in real-time when patients exceed a certain risk threshold and intervene proactively to address and prevent adverse events, and provide better outcomes. The early results have been exceptional. During the 90-day pilot:

- Cardiac arrests and other adverse events outside of the ICU were reduced by 44%.
- This approach predicted health status deterioration of hospitalized patients at a 90% accuracy rate.

Deploying Telehealth: *A Much-Needed Rural Network for Patients and Providers*

Ochsner has developed an extensive telehealth network, which serves more than 80 partners across the Gulf South, the majority of which are rural hospitals located throughout Louisiana and Mississippi. Unfortunately, these areas face a signifcant shortage of neurologists, psychiatrists,

[10] The Apple healthcare website also features a video describing aspects of the Optimal Hospital initiative and can be found under the heading "Apple in the Hospital" at https://www.apple.com/healthcare/.

[11] Milani RV, et al., *Reducing Hospital Toxicity: Impact on Patient Outcomes*, Am J Medicine 2018;131:961-66.

[12] A video explaining this program can be accessed at https://www.youtube.com/watch?v=ONgWbDALGAE&feature=youtu.be.

and other physician specialists, leaving too many communities without access to the specialty care their residents need and deserve.

Ochsner's telestroke program provides 24-hour/7-days per week coverage by vascular neurologists who – through telemedicine – are immediately available to emergency room physicians in rural hospitals to help them quickly diagnose and treat patients presenting with symptoms of a possible stroke. A key indicator for stroke outcome is prompt and accurate diagnosis – a delay in treatment can have catastrophic results. The program has been instrumental in successfully treating thousands of patients across the region (more than 300 patients per month) in a timely manner and offering an important source of clinical support and expertise for rural hospitals and their medical staffs. Expansion of rural partnerships with critical access hospitals (CAHs) also allows these facilities to remain successful in caring for their communities. They are keeping their doors wide open with upwards of 70% of telestroke patients staying local, when nearly all patients were transferred out in the past.

Building on the critical care component of telehealth, Ochsner has also been successful with emergency virtual psychiatric services, cutting emergency room wait times for psychiatric care at our partner sites by 50%. We also manage about 200 intensive care unit beds daily across our systemwide teleICU network, and we utilize similar technology and expertise to monitor laboring mothers with our obstetric ("telestork") program. Falls have been reduced by more than 90% with e-sitter technology, and our destination providers in multiple subspecialties are seeing patients in remote clinics or their homes – many miles from our hub facilities. And our most recent offering is with direct-to-patient urgent and primary care, removing barriers to care for patients and providers alike; this allows non-emergent medical visits to happen with near immediate access while keeping our population healthier and happier at home, work, or school.

Ochsner Health System

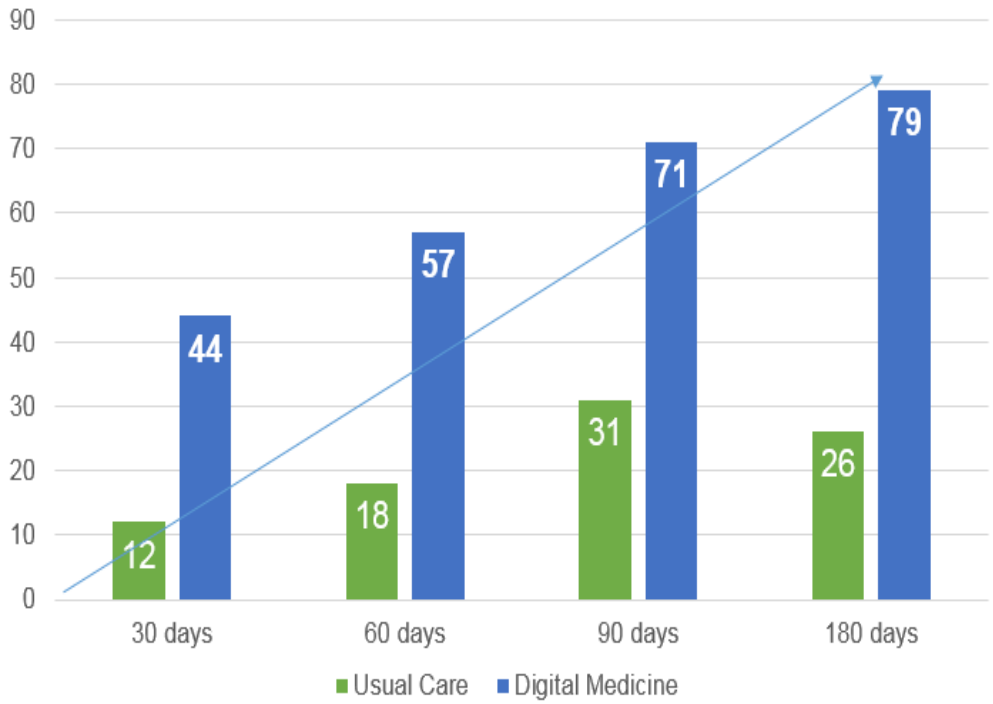
Managing Hypertension Effectively

Proven Program with Published, Award-Winning Results Driving Superior Health Outcomes

% Patients Achieving Blood Pressure Control

All had out of control BP at start;

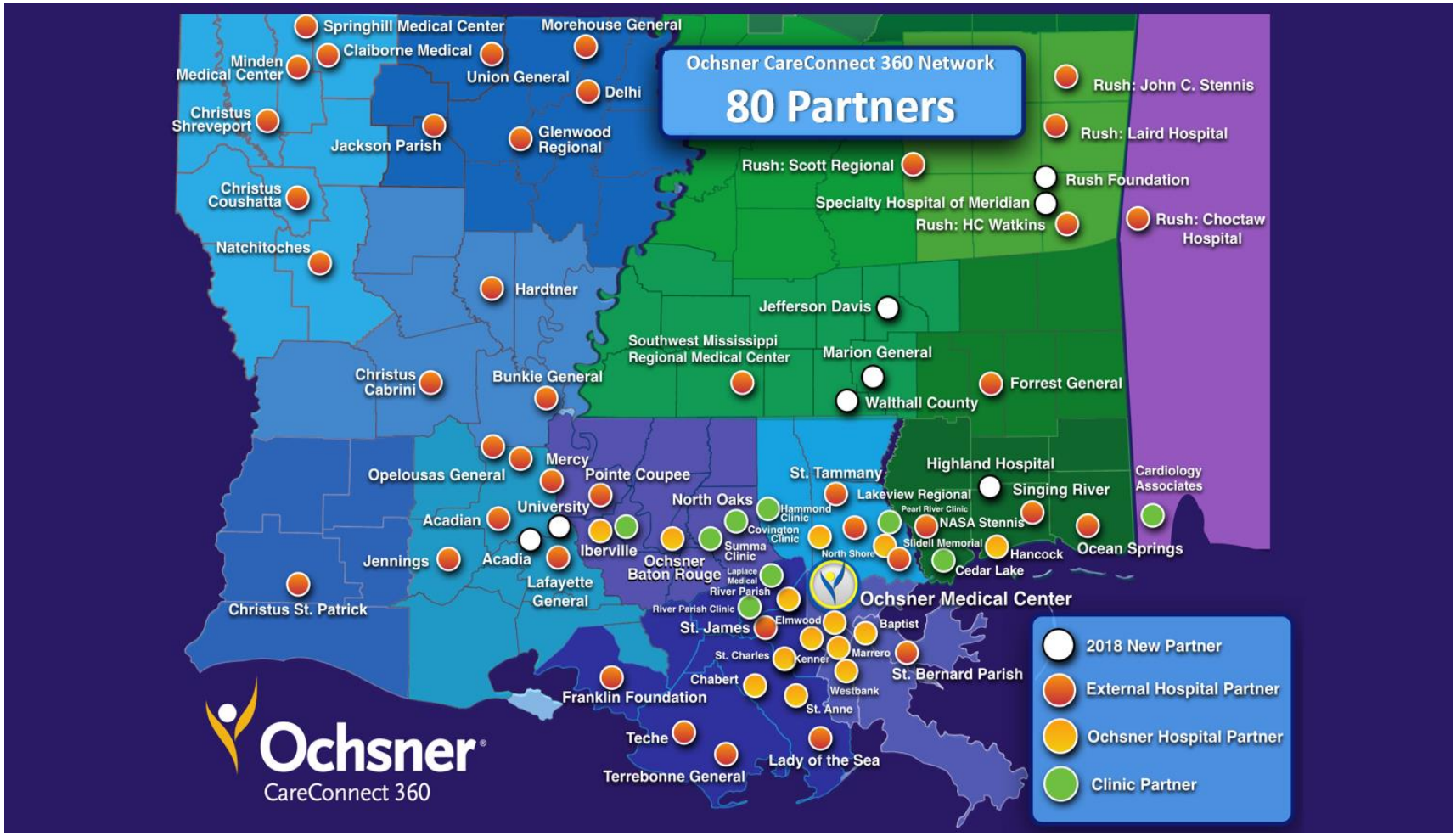
Digital Medicine outperformed traditional care models



Milani RV, et al. *Am J Medicine* 2017;130:14-20.

HARVARD BUSINESS SCHOOL + HARVARD MEDICAL SCHOOL
HEALTH ACCELERATION CHALLENGE
2016 FINALIST

ONC Patient Engagement PLAYBOOK


Ochsner CareConnect 360 Network
80 Partners
Springhill Medical Center
Morehouse General
Claiborne Medical
Minden Medical Center
Union General
Delhi
Christus Shreveport
Jackson Parish
Glenwood Regional
Christus Coushatta
Natchitoches
Hardtner
Rush: John C. Stennis
Rush: Laird Hospital
Rush: Scott Regional
Rush Foundation
Specialty Hospital of Meridian
Rush: HC Watkins
Rush: Choctaw Hospital
Jefferson Davis
Southwest Mississippi Regional Medical Center
Marion General
Forrest General
Walthall County
Christus Cabrini
Bunkie General
Opelousas General
Mercy
Pointe Coupee
St. Tammany
Highland Hospital
Cardiology Associates
Lakeview Regional
Singing River
North Oaks
Hammond Clinic
Pearl River Clinic
University
Acadian
Covington Clinic
NASA Stennis
Iberville
Summa Clinic
Slidell Memorial
Hancock
Ocean Springs
Jennings
Acadia
Ochsner Baton Rouge
Laplace Medical
Cedar Lake
Lafayette General
River Parish
Christus St. Patrick
River Parish Clinic
Ochsner Medical Center
St. James
Elmwood
Baptist
St. Charles
Kenner
Marrero
St. Bernard Parish
Chabert
Westbank
Franklin Foundation
St. Anne
Teche
Lady of the Sea
Terrebonne General
Ochsner CareConnect 360
2018 New Partner
External Hospital Partner
Ochsner Hospital Partner
Clinic Partner